

STATE OF ALASKA

Jay S. Hammond, Governor



Annual Performance Report for

INVENTORY AND CATALOGING OF SPORT FISH
AND SPORT FISH WATERS OF THE COPPER RIVER,
PRINCE WILLIAM SOUND AND THE UPPER
SUSITNA RIVER DRAINAGES

by

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Study No. G-I
Inventory and Cataloging

Job No. G-I-F	
Inventory and Cataloging of Sport Fish and Sport Fish Waters of the Copper River, Prince William Sound and the Upper Susitna River Drainages	Fred T. Williams

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RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations
of Alaska
Project No.: F-9-9
Study No.: G-I Study Title: INVENTORY AND CATALOGING
Job No.: G-I-F Job Title: Inventory and Cataloging of
Sport Fish and Sport Fish
Waters of the Copper River,
Prince William Sound and the
Upper Susitna River Drainages

Period Covered: July 1, 1976 to June 30, 1977.

ABSTRACT

Test netting was conducted on 17 managed lakes to determine survival and condition of experimentally stocked fish and the status of native fish stocks. Seven lakes, previously unsurveyed, were sampled with gill nets for fish population analysis.

A creel census of fishermen on the Gulkana River revealed that an estimated 2,721 anglers fished 12,344 hours and caught 296 chinook salmon, Oncorhynchus tshawytscha (Walbaum), and 707 sockeye salmon, O. nerka (Walbaum).

Twenty-five Arctic grayling, Thymallus arcticus (Pallas), tagged at Poplar Grove Creek during a study conducted from 1973 to 1975, were captured by sport anglers in 1976. Tag recovery data showed random intra-system movement. In 1975 one tagged grayling was caught 79 miles upstream from the tagging site. In 1976 another tagged grayling was taken at the same site.

During salmon escapement surveys conducted in 1976 on streams tributary to Valdez Bay, only 37 pink salmon, O. gorbuscha (Walbaum), were enumerated. In 1975, 58,707 pink salmon were counted. The low count of pink salmon in 1976 is due to poor escapement in 1972 and 1974.

Length and maturity data were collected from 67 burbot, Lota lota (Linnaeus), sport caught in Tolsona Lake. A comparison to data collected in 1967 and 1968 indicates no significant size difference.

Dissolved oxygen determinations made at Tolsona Lake indicate an inverse relationship between ice thickness and oxygen concentrations.

BACKGROUND

The Glennallen area is typical of many within the state in that recreational angling opportunity is provided by a number of anadromous species and also by indigenous and stocked lake and stream dwelling fishes.

The stream dwelling species most often taken by sport anglers are Arctic grayling, chinook, and sockeye salmon.

The principal lake dwelling species caught by recreational anglers in the Glennallen area are the indigenous species, burbot, Lota lota (Linnaeus), lake trout, Salvelinus namaycush (Walbaum), and Arctic grayling, Thymallus arcticus (Pallas); and the introduced species, coho salmon, Oncorhynchus kisutch (Walbaum), and rainbow trout, Salmo gairdneri Richardson.

The Cordova area is primarily commercial fishing oriented. Access to this area is only by boat or aircraft. Sport fishing effort is light and primarily on coho salmon, chinook salmon, and halibut, in salt water. Fresh water angling is concentrated on coho salmon, cutthroat trout, Dolly Varden, and stocked grayling. A significant increase in sport fishing effort is not anticipated until access to the area improves.

Most of the recreational angling opportunities in the Valdez area are provided by anadromous species, including pink, chum, and coho salmon, and bottom fish. All freshwater drainages into Valdez Arm are closed to salmon fishing, but Dolly Varden are taken in fair numbers.

The communities of Glennallen and Valdez are, like many communities in Alaska, currently undergoing marked increases in human population as a result of Trans-Alaska pipeline construction. Increases in recreational utilization of the salmon and freshwater species of the area have been substantial, requiring greater management effort and, in some cases, more restrictive angling regulations.

Activities reported in the following text are directed toward the research and management needs of these species and toward the attainment of desirable levels of angler utilization.

RECOMMENDATIONS

1. Continue tagging grayling in Poplar Grove Creek to determine migration patterns.
2. Continue the study of anadromous fish stocks in the upper Copper River drainage and Prince William Sound to determine timing and magnitude of runs.
3. Continue the monitoring of road and bridge construction, pipeline construction, and other land uses to afford maximum protection to the fishery resource and habitat.

4. Continue the evaluation of experimental fish stocking.
5. Continue cataloging and inventory surveys on a limited basis as required.
6. Continue to monitor burbot sport fisheries to determine trends in numbers caught and size.
7. Initiate investigations of grayling in the Gulkana River to determine age-length composition of sport caught fish.

OBJECTIVES

1. To determine the environmental characteristics of the existing and potential recreational fishing waters of the job area, and where practical, obtain estimates of the sport fish harvest and angler participation rates.
2. To assist in determining the current status of public access and access needs to the recreational fishing waters within the job area.
3. To determine stocking measures, formulate recommendations for the management of area waters, and direct the course of future studies.
4. To determine the magnitude of various fish stocks and develop plans for their enhancement.
5. To determine the effects of proposed construction programs on fisheries and fisheries environments.

TECHNIQUES USED

Standard techniques described by Williams (1971) were used in lake and stream surveys and for collection of fish samples. Each test netting was conducted for a minimum of 16 hours, including an overnight period. Stream surveys (salmon enumerations) were made from aircraft and on foot. All measurements of fish length were from snout to fork of tail.

During a creel census on the Gulkana River the fishing day was determined to be between the hours of 8 a.m. and midnight and was further divided into two eight-hour periods. Weekend days and holidays were each censused for one randomly chosen eight-hour period; two randomly chosen weekdays per week were censused for one randomly selected eight-hour period.

The Gulkana River was divided into three sections based on accessibility. These sections were (1) lower, from the mouth upstream two miles, (2) middle, in the vicinity of the Richardson Highway bridge, and (3) upper, (Sourdough) from the mouth of Sourdough Creek upstream to the West Fork of the Gulkana River.

Fishermen and boats were aerially enumerated in conjunction with ground angler checks. Harvest and effort were calculated by methods described by Neuhold and Lu (1957).

FINDINGS

Results

Population Sampling, Managed Lakes:

Test netting was conducted on 17 managed lakes in the Upper Copper River drainage during 1976 and the results are shown in Table 1. The following are lakes where netting yielded significant results.

Buffalo Lake is a small, four acre lake located at Mile 156, Glenn Highway. This lake was barren of fish prior to 1971. Buffalo Lake has been stocked four times since 1971 with Ennis, Montana, and Winthrop, Washington stocks of rainbow trout, Salmo gairdneri (Richardson). Since 1972, 125 foot variable mesh gill nets have been set in this lake 11 times, for a total of 237 fishing hours. The catch of rainbow trout per net hour for all test netting combined is 0.09 (Williams; 1972, '73, '75, and '76). The 1976 catch per net hour was 0.40 and is included in the combined data.

Late winter dissolved oxygen concentrations range from 3.0 to 9.5 ppm and no evidence of winter kill has been observed. It is apparent that rainbow trout, or at least the two strains stocked, are not compatible with the biological characteristics of Buffalo Lake. In 1976 the lake was stocked with coho salmon, Oncorhynchus kisutch (Walbaum).

Junction Lake, located on the Lake Louise road, has been stocked with Arctic grayling since 1966. Test netting since that time has caught grayling at rates varying from 0.90 to 3.00 fish per net hour. In 1976 grayling were taken at a rate of 1.95 fish per net hour and the average fork length of 283 mm was longer than in any previous year.

Blueberry Lake, near Valdez, has been stocked with rainbow trout since 1958. Until 1966 stocking was generally done on an annual or biannual basis. This 10-acre lake was stocked at rates varying from 500 to 1,900 fingerling rainbow trout per surface acre per year. During this period the catch of trout per net hour varied from 0.16 to 0.58 and averaged 0.40. From 1966 to the present the stocking rates varied from 200 to 300 rainbow trout fingerlings per surface acre on a biennial basis. During this same period (1966 to 1976) the catch of trout per net hour varied from 0.04 to 1.26 and averaged 0.69. It is apparent from this data that a stocking rate of 300 fingerling rainbow trout per surface acre on a biennial basis is adequate and a higher stocking density will only result in a waste of hatchery produced fish. (Williams; 1964, '66, '69, and '72)

Table 2 is a comparison of net frequency of grayling and numbers of grayling fry stocked in Tolsona Lake since 1967. Stocking in any given year did not affect the net frequency for that year since the grayling fry stocked were less than 25 mm in length. From these data it is apparent that stocking has increased the net frequency for grayling in Tolsona

Table 1. Gill Net Summary, Managed Lakes, Upper Copper River Drainage

Name	Location	Number of fish	Species*	Length Range (mm)	Mean Length (mm)	Frequency**	Percent Composition
Buffalo	T3N R7W S2	8	RB	190-298	220	0.40	100
Crater (Lake Louise Road)	T4N R6W S29	1	SS	360	360	0.05	100
Junction	T4N R6W S33	39	GR	230-350	283	1.95	100
Forgotten	T4N R7W S15	14	GR	170-285	228	0.78	100
Mae West	T4N R5W S26,35	3	GR	90-100	93	0.14	100
Tolsona	T4N R5W S24	119	GR	126-409	300	2.48	31
		260	SK	96-458	221	5.41	68
		1	DV	346	346	0.02	1
Moose	T4N R5W S13	35	GR	125-370	257	1.45	21
		133	SK	105-255	220	5.54	79
Jack	T9N R11E S35,36	26	WF	265-465	331	0.93	48
		28	GR	125-340	249	1.00	52
Kettle	T9N R11E S18	5	SK	225-375	307	0.11	83
		1	LT	575	575	0.02	17
Big Twin	T9N R11E S25	26	GR	110-330	205	1.36	96
		1	WF	320	320	0.05	4
Little Twin	T9N R11E S25	9	GR	135-270	206	0.45	100

Table 1. (Cont.) Gill Net Summary, Managed Lakes, Upper Copper River Drainage

Name	Location	Number of fish	Species*	Length Range (mm)	Mean Length (mm)	Frequency**	Percent Composition
Hanagita	T7S R9E S28	1	RS	770	770	0.33	100
Mirror	T3N R8W S23	27	GR	120-365	284	1.54	100
Seven Mile	T21S R11E S15	12	GR	210-235	219	0.27	30
		28	LT	290-470	408	0.64	70
Thompson	T8S R3W S26	1	RB	440	440	0.03	14
		6	GR	300-320	311	0.20	86
Blueberry	T9S R3W S2	8	RB	90-245	132	0.53	100
Worthington	T9S R3W S1	13	RB	100-530	247	0.34	100

* Species

GR - Grayling

RB - Rainbow

SS - Coho salmon

SK - Sucker (Castomus castomus)

DV - Dolly Varden

LT - Lake Trout

WF - Whitefish (Coregonus sp)

RS - Sockeye salmon

** Frequency is number of fish per net hour.

Table 2. A Comparison of Net Frequency of Grayling and Numbers of Grayling Fry Stocked in Tolsona Lake, 1967-1976.

Year	Net Frequency*	Numbers of Grayling Stocked
1967	0.14	
1968	0.50	100,000
1969	1.05	175,000
1970	2.18	100,000
1971	1.66	
1972	2.10	180,000
1973	2.74	75,000
1974	2.25	
1975	2.25	80,000
1976	<u>2.48</u>	<u>250,000</u>
Average	1.74	137,143

* Net frequency is number of fish caught per net hour.

Lake; however, it is not a clear and direct relationship. During the period covered in the table, sport fishing has been excellent and there has been more than adequate numbers of mature grayling available for artificial egg takes. A stocking rate of 100,000 grayling fry should be adequate to maintain a healthy population. (Williams, 1967-1976)

Seven Mile Lake is located approximately one mile from the Denali Highway. Access to the lake prior to 1973 was by foot trail and fishing pressure was considered light. In 1973 an access road to the lake was constructed by the Alaska Department of Highways. That same year test nets were set in the lake and 31 lake trout, Salvelinus namaycush (Walbaum), taken that year ranged in fork length from 400 to 455 mm and averaged 430 mm. In 1976 nets were again set in the lake to determine the effect, if any, on the fisheries as a result of improved accessibility. The test nets caught 28 lake trout that ranged from 290 to 470 mm and averaged 408 mm. The fish per net hour in 1973 was 0.70 and in 1976 it was 0.64. There is no evidence at this time that improved access, and an accompanying increase in fishing pressure has had any influence on the lake trout in Seven Mile Lake.

During the 1976 test netting on Seven Mile Lake, 12 grayling were taken that ranged in fork length from 210-235 mm and averaged 219 mm. These grayling, age III, are the first grayling ever taken from the lake since test netting was initiated in 1960. Adult grayling may have migrated upstream from another lake and spawned in the outlet of Seven Mile Lake. The progeny then moved on into Seven Mile Lake.

Population Sampling - New Lakes:

In 1976, seven previously unsurveyed lakes were investigated. Biological and physical data are presented in Tables 3 and 4.

Stream Surveys:

Surveys were conducted on seven streams along the Denali Highway, five on the Richardson Highway and nine along the Glenn Highway. Biological and physical data on these streams are on file in the Glennallen Fish and Game office. In general, the streams were quite low and few fish were collected. Grayling was the principle species encountered. Collecting fish with a backpack electroshocker proved unsatisfactory as it failed to shock the fish. Seining was tried with slightly better results.

Gulkana River Creel Census:

A creel census of recreational salmon fishermen was again conducted on the Gulkana River (Figure 1). The estimated effort and harvest is presented and compared to 1975 data in Table 5. The catch per angler hour for chinook salmon, O. tshawytscha (Walbaum), was again higher in the upper Sourdough River section (.044) than in the middle (.018) and lower (.013) sections. The reason for this is because the fly-fishing-only regulation in effect in the lower and middle river sections tends to limit the sport harvest.

The 1976 chinook salmon harvest from the upper river, or Sourdough section, was only 27% of the 1975 harvest because low water conditions

Table 3. Gill Net Summaries, Previously Unsurveyed Lakes, Copper River Drainage, 1976.

Name	Location	Number of fish	Species*	Length Range (mm)	Mean Length (mm)	Frequency**	Percent Composition
Sucker	T8N R5W S19,20,21	79	SK	159-406	326	1.98	45
		22	WF	187-324	282	0.55	12
		75	GR	102-248	161	1.88	42
		1	BB	597	597	0.03	1
Little Woods Creek	T4N R6W S9	19	SK	215-370	331	0.48	66
		10	GR	110-240	130	0.25	34
West Fork #2	T11N R8W S9,10	67	WF	220-340	266	1.50	99
		1	BB	750	750	0.02	1
Old Road	T4N R7W S14,15	0	0				
Willow	T1S R1E S11,13,14	0	0				
Round	T4N R7W S14,15	0	0				
Tiny	T4N R7W S16	0	0				

* SK - Sucker
 WF - Whitefish
 GR - Grayling
 BB - Burbot

** Frequency is the number of fish per net hour.

Table 4. Physical and Biological Data from Previously Unsurveyed Lakes in the Copper River Drainage.

Lake	Surface Area Acres	Maximum Depth (ft)	Percent of Shoal Area	Fish Species* Present	Location by Bay or Drainage
Sucker	700	24	50	SK, WF, GR, BB	Tazlina River Copper River
Willow	540	6	100	0	Copper River
Little Woods Creek	60	24	60	SK, GR	Little Woods Creek Tazlina River Copper River
West Fork #2	200	23	50	WF, BB	W. Fork Gulkana River Gulkana River Copper River
Old Road	1.5	13	100	0	Tolsona Creek Tazlina River Copper River
Round	2	16	80	0	Tolsona Creek Tazlina River Copper River
Tiny	2.5	15	100	0	Mendeltna Creek Tazlina River Copper River

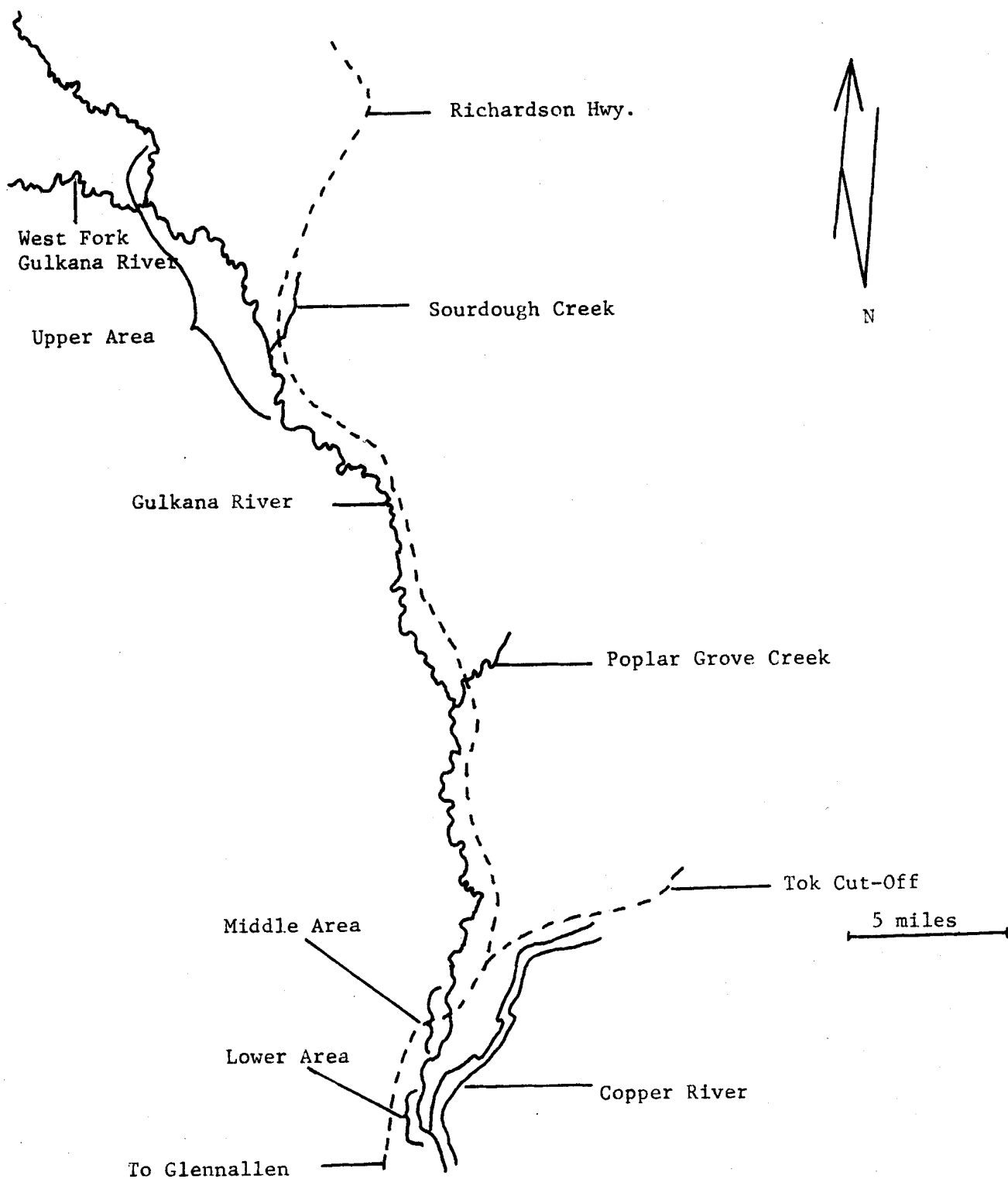


Figure 1. Gulkana River Creel Census Areas.

Table 5. Gulkana River Sport Harvest and Effort Estimates, 1975-1976.

	Lower Section		Middle Section		Sourdough		All Sections	
	1975	1976	1975	1976	1975	1976	1975	1976
No. of anglers	639	872	803	982	1,292	867	2,734	2,721
No. of hours	3,112	4,670	3,771	3,933	6,288	3,741	13,171	12,344
Hours per angler	4.87	5.36	4.70	4.01	4.87	4.31	4.72	4.54
Catch								
Chinook	43	62	52	70	602	164	697	296
Sockeye	15	252	19	138	13	317	47	707
Total salmon	58	314	71	208	615	481	744	1,003
Grayling		0		20		670		690
Rainbow trout		10		0		60		70
Catch per angler								
Chinook	.067	0.071	.065	0.071	.466	0.189	.255	0.109
Sockeye	.023	0.289	.024	0.141	.010	0.366	.017	0.260
Total salmon	.090	0.360	.089	0.212	.476	0.555	.272	0.369
Catch per angler hour								
Chinook	.014	0.013	.014	0.018	.096	0.044	.053	0.024
Sockeye	.005	0.054	.005	0.035	.002	0.085	.004	0.057
Total salmon	.019	0.067	.019	0.053	.098	0.129	.057	0.081

made it difficult to operate boats after early July, thus limiting total harvest. In 1975, 86% of the total chinook salmon catch came from the upper area while in 1976 it was reduced to 55%.

In 1975 only 47 sockeye salmon, *O. nerka* (Walbaum), were taken in the sport fishery, but this harvest increased to a catch of 707 in 1976. The escapement of sockeye salmon into the Gulkana River in 1975 was the lowest in 12 years. The escapement of sockeye salmon into the Gulkana River in 1976, however, was much better and anglers are developing more skill in catching salmon with flies, thus the increased sport harvest of sockeye salmon.

The residency of anglers checked during the 1976 Gulkana River creel census is shown in Table 6 and compared to 1975 data.

The decline in anglers from Anchorage is attributed to the excellent chinook salmon fishing on the Kenai Peninsula in 1976.

Chinook Salmon Escapement:

Chinook salmon aerial escapement surveys were conducted on selected streams in the Upper Copper River in 1976. The 1971 through 1976 counts are shown in Table 7. Counting conditions were generally good and a count of 994 chinook salmon in the Gulkana River, after the sport fishery, is considered adequate escapement for the system.

Gulkana River Chinook Salmon:

During the Gulkana River creel census, scales were collected from chinook salmon killed by sport fishermen. A comparison of fork length range and average fork length of Gulkana River chinook salmon from 1972 through 1976 is presented in Table 8. These data show insignificant differences in length range and average lengths of chinook salmon over this five year period.

Age length composition for sport caught chinook salmon is shown in Table 9. The age 1.3 fish were by far the most frequently caught age class in these two years.

Poplar Grove Creek Grayling:

In the spring of 1973 a study of the swimming ability of grayling was initiated at Poplar Grove Creek, tributary to the Gulkana River. This study was conducted by the University of Idaho under a grant from the U.S. Fish and Wildlife Service. During trapping operations 276 grayling were marked with Floy tags by the Alaska Department of Fish and Game. In 1974 and 1975 an additional 317 and 528 grayling were similarly tagged.

Since the initial tagging, 75 marked grayling, caught by sport fishermen, have been reported. Sixty-seven percent of these grayling were caught in Poplar Grove Creek and the remainder were taken from the Gulkana River (Figure 2).

Table 6. Residency of Anglers Fishing the Gulkana River in 1975-1976.

	1975	1976
No. from Alaska Communities	11	15
No. from Other States	19	20
No. from Other Countries	2	2
Percent from Alaska	91	91
Percent from Anchorage	55	37
Percent from Fairbanks	21	32

Table 7. Chinook Salmon Aerial Surveys, Upper Copper River Tributaries, 1971-1976*.

Stream	1971	1972	1973	1974	1975**	1976
Gulkana River	759	1,207	1,060	1,293	740	994
East Fork Chistochina River	512	348	476	138	71	289
Mendeltna Creek	56	49	15	13	NC	35
Kaina Creek	81	89	172	55	NC	37
Grayling Creek	45	47	47	0	NC	17

* The figures are actual counts and not estimates. These data are considered as minimum escapement figures.

** Counting conditions in 1975 were generally poor due to high, muddy water during most of the season.

NC No counts made.

Table 8. Lengths of Gulkana River Chinook Salmon, 1972-1976.

Year	1972	1973	1974	1975	1976
Number of Fish	33	38	37	93	50
Length Range (mm)	770-1,160	665-1,210	650-1,222	724-1,219	673-1,240
Average Length (mm)	1,026	1,025	1,089	1,001	1,027

Table 9. Length-Age Data from Gulkana River Chinook Salmon, 1975-1976.

Age	<u>1975</u> 1.2	<u>1976</u>	<u>1975</u> 1.3	<u>1976</u>	<u>1975</u> 1.4	<u>1976</u>
Percent of Total	3%	26%	62%	62%	35%	12%
Average Length (mm)	754	696	919	1,015	1,105	1,122
Length Range (mm)	635-904	673-1,000	840-1,041	934-1,200	991-1,219	1,034-1,240

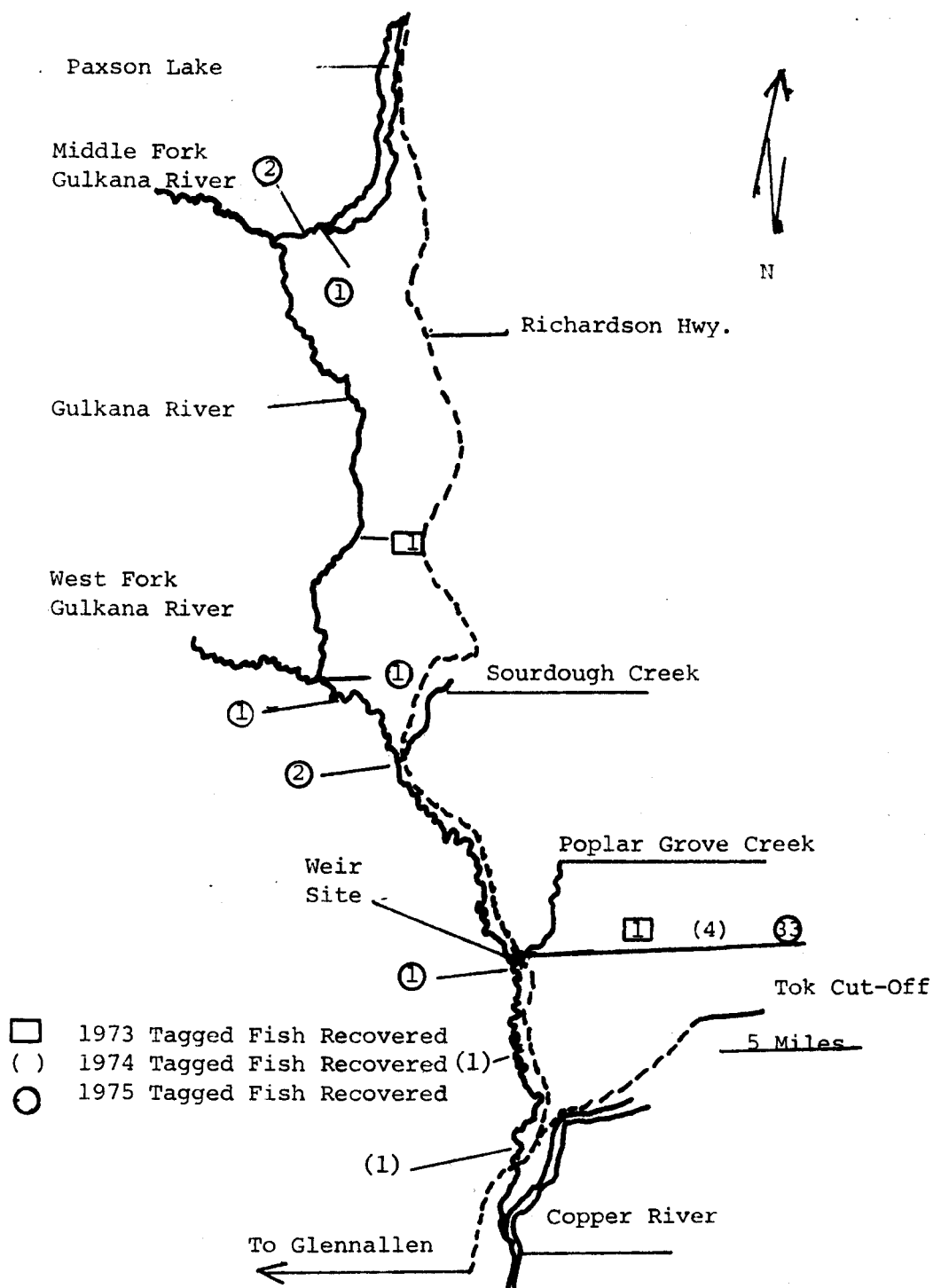


Figure 2. Tagged Grayling Recoveries, Poplar Grove Creek and Gulkana River, 1975.

Tagged grayling were caught and reported by anglers as far as 79 miles upstream and 14 miles downstream from the mouth of Poplar Grove Creek, indicating random intra-system movement.

Port Valdez Stream Survey:

Adult salmon enumeration in the Valdez area was continued in 1976 (Table 10). The effects of the poor pink salmon, O. gorbuscha (Walbaum) escapements in 1972 and 1974 are evident in 1976. Coupled with these poor parent escapements is the increase in human intrusion into salmon habitat. Chum salmon, O. keta (Walbaum), and coho salmon numbers were also low in 1976.

Counts were made only in the clear water tributaries of the Lowe River and Mineral Creek systems (Figure 3). Glacial siltation in some of the tributary streams makes salmon enumerations impossible.

Tolsona Lake Burbot:

Burbot, Lota lota (Linnaeus), taken by sport fishermen in Tolsona Lake during the 1976-1977 winter were measured, sexed, and aged. The age-length data are presented in Figure 4. All of the burbot represented in this Figure were sexually mature and would spawn that winter. Lengths of burbot sport caught from Tolsona Lake during three winter fisheries is presented in Table 11. These data indicate that the average length of sport caught burbot has not decreased and the lake is in all likelihood not overfished.

Tolsona Lake Dissolved Oxygen Determinations:

During the 1975-1976 winter dissolved oxygen determinations were made on Tolsona Lake from December through April. This data is presented in Figure 5.

The maximum ice thickness ever recorded for Tolsona Lake was 101.6 cm (44 inches) on April 8, 1976. Dissolved oxygen concentrations during the sampling period were the highest of any winter since testing was first initiated in 1963.

A lack of snow cover during the first two months of ice cover on the lake allowed the process of photosynthesis to continue during that period. This unusual occurrence was responsible for the production of oxygen during a period when dissolved oxygen is normally being reduced. In addition, the inlet of Tolsona Lake, Bessie Creek, continued to flow until late December. Normally this stream freezes to the bottom by early November. Regardless of the abnormally high dissolved oxygen, Figure 5 does demonstrate an inverse relationship between ice thickness and amounts of dissolved oxygen.

Tex Smith Lake Outlet Structure:

The outlet control structure installed in Tex Smith Lake in 1975 was monitored through the winter of 1975-76 and the summer of 1976. The

Table 10. Port of Valdez Salmon Counts, 1971-1976.

Stream	#137 Lowe River System	#137 Robe Lake System	#141 Loop Road I	#143 Siwash	#145 City Limits	#147 Mineral Creek System
<u>Pink Salmon</u>						
1971	13,490	4,500	875	13,040	690	1,320
1972	0	0	475	161	46	320
1973	6,549	15,000	7,000	26,770	1,700	2,235
1974	N/C	N/C	262	8	98	217
1975	15,387	2,461	5,537	33,113	1,262	947
1976	1	0	18	5	5	8
<u>Chum Salmon</u>						
1971	411	P	N/C	120	2,660	1,778
1972	2,007	40	45	162	1,200	180
1973	1,063	125	N/C	232	1,812	7,111
1974	N/C	N/C	0	16	483	1,454
1975	N/C	N/C	N/C	N/C	N/C	N/C
1976	270	0	6	2	1,080	564
<u>Coho Salmon</u>						
1971	193	9,690	N/R	57	N/R	300
1972	211	875	N/R	41	N/R	14
1973	67	4,000	N/R	6	N/R	20
1974	78	1,662	N/R	0	N/R	0
1975	1,506	1,533*	N/R	0	N/R	16
1976	1,310	1,049*	0	0	2	66

Table 10. (Cont.) Port of Valdez Salmon Counts, 1971-1976.

Stream	#137 Lowe River System	#137 Robe Lake System	#141 Loop Road I	#143 Siwash	#145 City Limits	#147 Mineral Creek System
<u>Sockeye Salmon</u>						
1971	N/C	N/C	0	N/R	N/R	N/R
1972	27	5,000	0	N/R	N/R	N/R
1973	0	1,300	0	N/R	N/R	N/R
1974	0	3,000	0	N/R	N/R	N/R
1975	N/C	N/C	N/C	N/C	N/C	N/C
1976	1	N/C	0	0	1	2

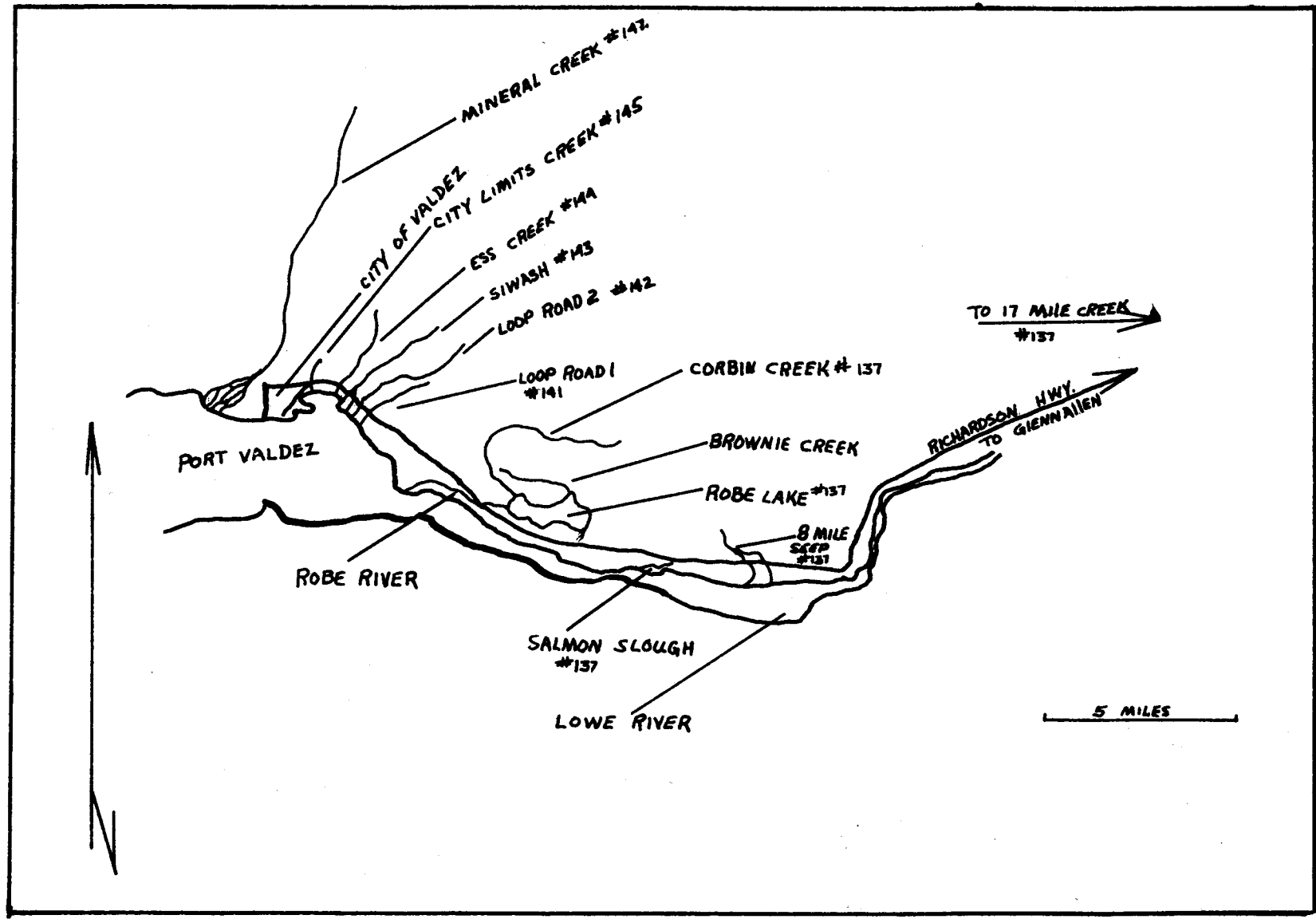
P - Present, but not counted

N/C - No count taken

N/R - No run

* - 1975 and 1976 S.S. counts included Robe River.

Figure 3. Salmon Spawning Streams in Upper Valdez Bay.



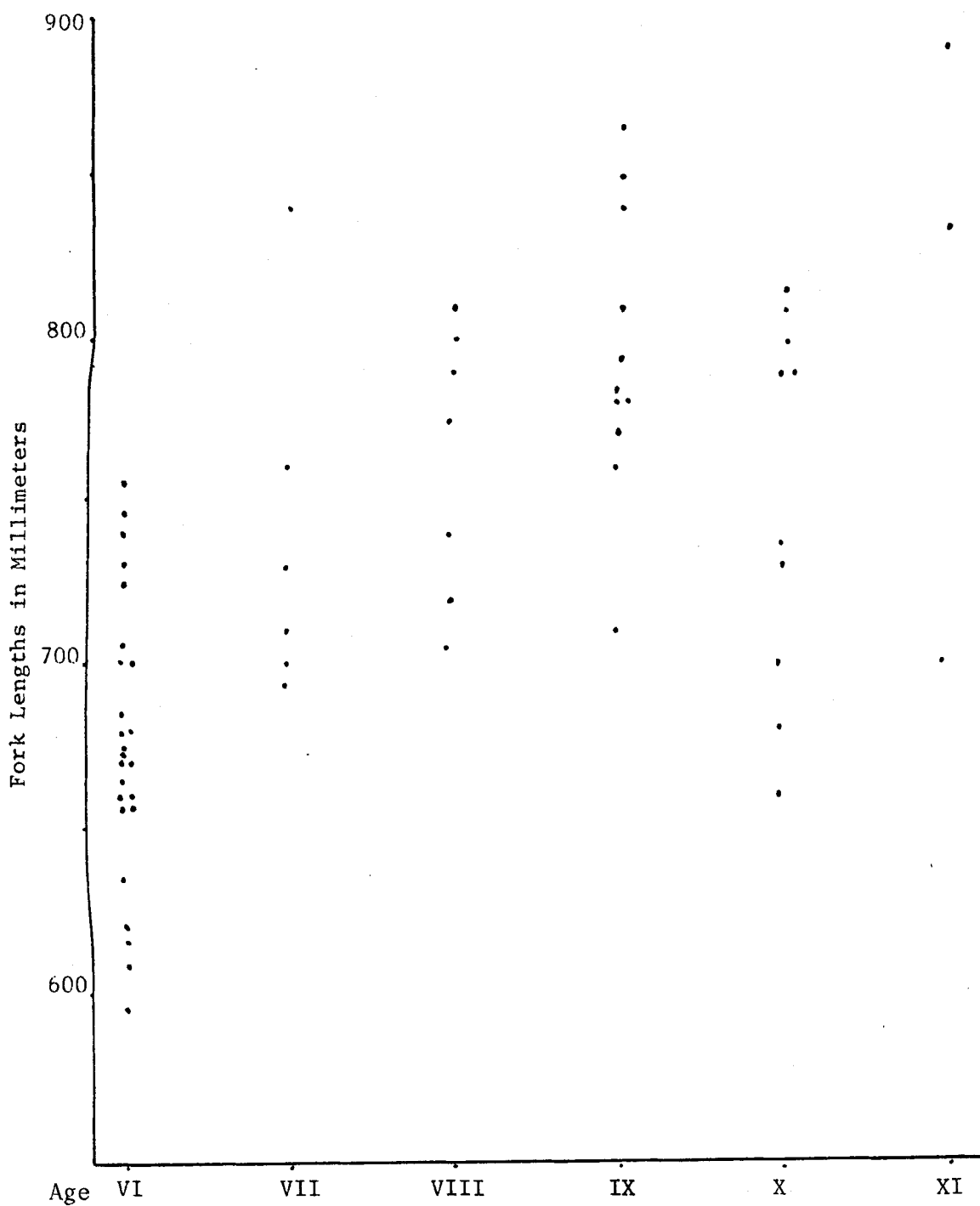


Figure 4. Age-length Relationship of Burbot from Tolsona Lake. 1976.

Table 11. Lengths of Sport Caught Burbot from Tolsona Lake, 1967-1968, 1968-1969, and 1976-1977.

Year	Number	Length Range	Average Length
1967-68	23	371-724	641
1968-69	20	455-720	539
1976-77	67	595-890	730

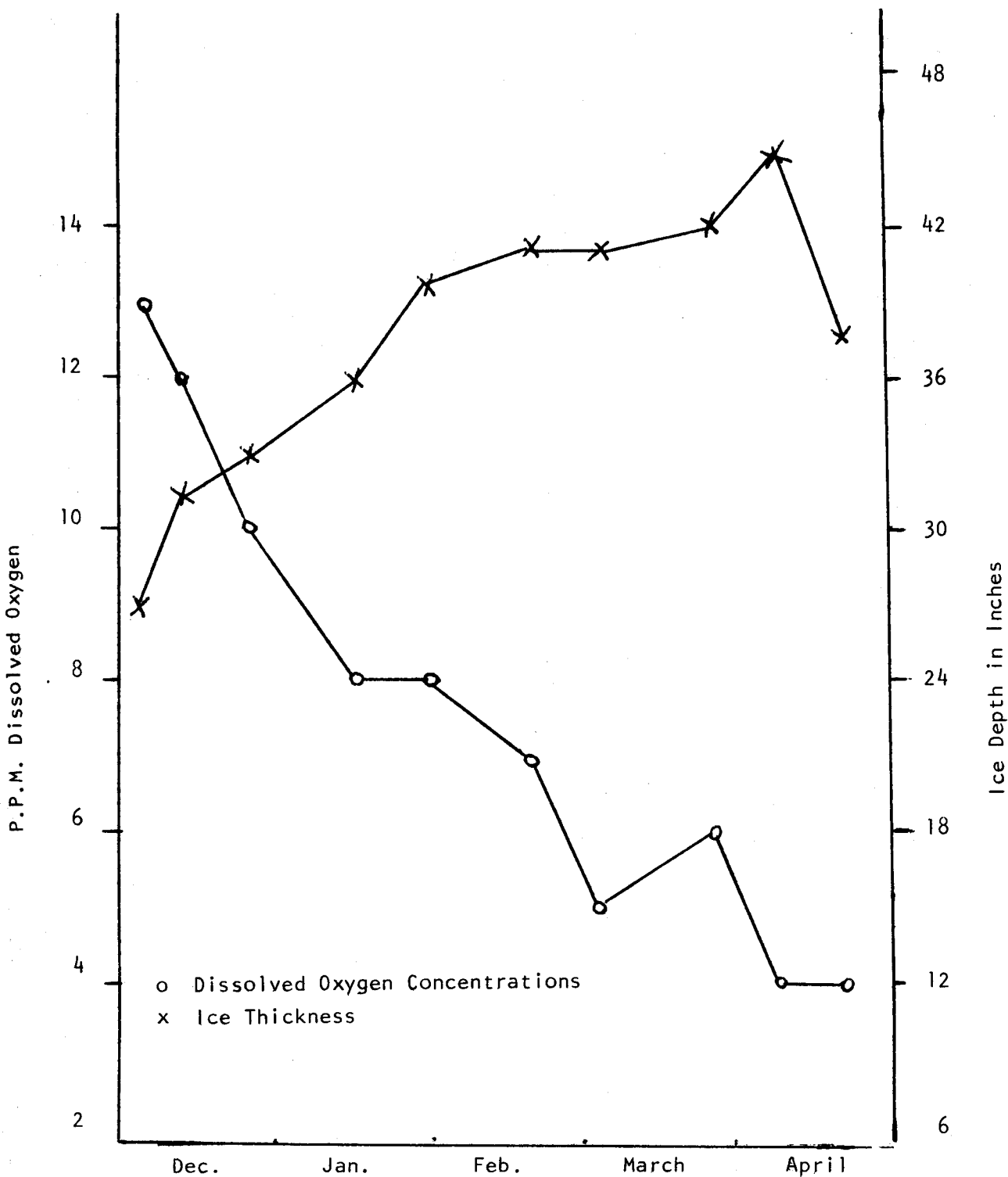


Figure 5. A Comparison of Ice Thickness and P.P.M. of Dissolved Oxygen in Tolsona Lake, Winter 1975-76.

only problem encountered was a minor washout next to the horizontal pipe. This occurred because the soil around the pipe was not sufficiently compacted when the structure was installed. It was not necessary to clean the screens at any time.

Habitat Protection Investigations:

Ten highway construction related projects were reviewed. Other projects that were reviewed for potential damage to fisheries included cable laying in Glennallen, Valdez sewer system construction, stream crossings, airport construction, subdivision construction and seismic operations. Recommendations and stipulations were made to the Habitat Section to protect the fisheries.

DISCUSSION

Analysis of stocking rates and catch per net hour of stocked fish indicate that in some lakes stocking numbers can be reduced and an adequate population density will still be maintained.

Measurements of sport caught burbot from Tolsona Lake indicate no reduction in size since 1967.

The sport catch of chinook salmon was less than in 1975. This is attributed to low water conditions in the Sourdough area which made use of boats extremely difficult. In 1975 this area accounted for 86% of the total catch while in 1976 it was reduced to 55%. The sport catch of sockeye salmon was 707 in 1976, compared to only 47 in 1975. The 1975 escapement was the lowest in 12 years. In addition, in 1975 an anti-snagging regulation went into effect. Previously, snagging was the most common method of catching sockeye salmon. Observations of anglers indicate they are developing more skill in catching sockeye salmon with flies.

Aerial surveys of chinook salmon in the Gulkana River since 1971 have averaged 1,000 fish annually. The enumeration of 994 chinook salmon after the sport fishery is considered adequate for the system. The Gulkana River system could accommodate a larger number of spawning chinook salmon but this could be accomplished only by reducing the sport or commercial catch.

Gulkana River sport fishermen took about 1% of the total chinook salmon caught by subsistence and commercial fishermen.

The escapement numbers of pink salmon into the streams tributary to Valdez Bay have recently been much higher during odd numbered years. This was graphically demonstrated in 1975 and 1976. The 1975 pink salmon escapement was 58,707 and in 1976 it was only 37.

Tag return data from sport caught grayling tagged at Poplar Grove Creek in 1973, 1974 and 1975 continues to show a random intra-system movement.

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